

Atty. Docket No. 2003-0048-01
USSN 10/672,722

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original): A gas discharge laser comprising a laser gas containing fluorine comprising:

an elongated gas discharge electrode comprising an electrode body having a centerline axis;

a pair of side walls on either side of the centerline axis;

an elongated preionization tube extending longitudinally beside the elongated gas discharge region on a preionizer side of the elongated gas discharge electrode;

a crown straddling the centerline axis between the pair of side walls and the pair of end walls, comprising a first material, forming at least a portion of the discharge region of the electrode;

the pair of side walls being generally flat in traverse cross section in the region of the crown;

the crown in traverse cross section having the shape of the upper half of a canted ellipse rotated in the preionizer direction, such that a tangent to the short centerline axis of the ellipse forms an angle with the horizontal.

2. (original): A fluorine gas discharge anode comprising

an anode blade having a top portion and a first and second sidewall portion each intersecting the top portion;

a front side portion on the front side of the anode blade;

a rear side portion on the rear side of the anode blade;

an asymmetric discharge side of the anode blade;

the anode blade being formed with the shape in cross section of the top portion being curvilinear and intersecting the generally straight portions of each of the first and

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second sidewall portions along a radius of curvature and with the top portion beveled away from the asymmetric discharge side of the anode.

3. (currently amended): A gas discharge laser having a laser gas containing fluorine, flowing through a discharge region between an anode and a cathode from an upstream flow side to a downstream flow side comprising:

an anode and an up-stream fairing each composed of electrically conductive material, at least the discharge receiving portion of which is anodized.

4. (original): The apparatus of claim 3 further comprising:
the anode and up-stream fairing are constructed as one piece.

5. (previously presented): The apparatus of claim 3 further comprising:
at least all of the surfaces of the anode and the upstream fairing that are exposed to the laser gas are anodized.

6. (previously presented): The apparatus of claim 4 further comprising:
at least all of the exposed surfaces of the one piece anode and up-stream fairing that are exposed to the laser gas are anodized.

7. (original): The apparatus of claim 3 further comprising:
the thickness of the anodized layer on the discharge footprint of the electrode is selected according to a desired impedance and erosion resistance.

8. (original): The apparatus of claim 4 further comprising:
the thickness of the anodized layer on the discharge footprint of the electrode is selected according to a desired impedance and erosion resistance.

9. (original): The apparatus of claim 5 further comprising:
the thickness of the anodized layer on the discharge footprint of the electrode is selected according to a desired impedance and erosion resistance.

10. (original): The apparatus of claim 6 further comprising:

the thickness of the anodized layer on the discharge footprint of the electrode is selected according to a desired impedance and erosion resistance.

11. (previously presented): A gas discharge laser comprising a laser gas containing fluorine:

an elongated gas discharge anode comprising a discharge region extending longitudinally along the surface of the elongated gas discharge anode;

at least a portion of the discharge region covered with a pre-formed reef having generally uniform pore size and distribution.

12. (original): The apparatus of claim 11 further comprising:

the pre-formed reef is formed of a porous anodized material.

13. (original): The apparatus of claim 12 further comprising:

the pre-formed reef is formed of a vacuum infiltrated porous anodized material.

14. (original): The apparatus of claim 12 further comprising:

the surface of at least the discharge region is mechanically textured prior to the formation of the pre-formed reef.

15. (original): The apparatus of claim 13 further comprising:

the surface of at least the discharge region is mechanically textured prior to the formation of the pre-formed reef.

16. (original): The apparatus of claim 14 further comprising:

the surface texturing comprises a mechanically embossed surface.

17. (original): The apparatus of claim 15 further comprising:

the surface texturing comprises a mechanically embossed surface.

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18. (original): The apparatus of claim 14 further comprising:
the surface texturing is applied with a mechanical punch.

19. (original): The apparatus of claim 15 further comprising:
the surface texturing is applied with a mechanical punch.

20. (original): The apparatus of claim 14 further comprising:
the surface texturing is applied by drilling seed holes.

21. (original): The apparatus of claim 15 further comprising:
the surface texturing is applied by drilling seed holes.

22. (original): The apparatus of claim 14 further comprising:
the surface texturing is applied by grit blasting.

23. (original): The apparatus of claim 15 further comprising:
the surface texturing is applied by grit blasting.

24. (original): The apparatus of claim 11 further comprising:
the preformed reef comprising a conductive material selected from the group of
aluminum, copper and copper alloys.

25. (original): The apparatus of claim 12 further comprising:
the preformed reef comprising a conductive material selected from the group of
aluminum, copper and copper alloys.

26. (original): The apparatus of claim 13 further comprising:
the preformed reef comprising a conductive material selected from the group of
aluminum, copper and copper alloys.

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27. (original): The apparatus of claim 14 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

28. (original): The apparatus of claim 15 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

29. (original): The apparatus of claim 16 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

30. (original): The apparatus of claim 17 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

31. (original): The apparatus of claim 18 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

32. (original): The apparatus of claim 19 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

33. (original): The apparatus of claim 20 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

34. (original): The apparatus of claim 21 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

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35. (original): The apparatus of claim 22 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

36. (original): The apparatus of claim 23 further comprising:

the preformed reef comprising a conductive material selected from the group of aluminum, copper and copper alloys.

37. (previously presented): A method for producing a gas discharge electrode discharge region pre-formed reef for an elongated gas discharge electrode for a gas discharge laser comprising a laser gas containing fluorine, comprising the steps of:

forming a first anodization layer on the surface of the electrode at least in the discharge region;

removing the first anodization layer;

forming a second anodization layer on the surface of the electrode at least in the discharge region.

38. (original): The method of claim 37 further comprising the steps of:

widening the pores in the second anodization layer.

39. (original): The method of claim 38 further comprising the steps of:

thinning the second anodization layer.

40. (previously presented): The method of claim 39 further comprising the steps of:
filling the pores with a conductive material.

41. (previously presented): A method for producing a gas discharge electrode discharge region pre-formed reef for an elongated gas discharge electrode for a gas discharge laser comprising a laser gas containing fluorine, comprising the steps of:

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forming a reef template on at least the discharge region of the elongated gas discharge region;

selectively growing a porous layer of insulating material as dictated by the reef template.

42. (previously presented): The method of claim 41 further comprising:
using a positive reef template.

43. (previously presented): The method of claim 41 further comprising:
using a negative reef template.

44. (previously presented): The method of claim 42 further comprising:
the positive reef template comprises a pattern of depositions of a reef enhancing material on at least the discharge region.

45. (previously presented): The method of claim 43 further comprising:
the negative reef template comprises a pattern of depositions of reef inhibiting material on at least the discharge region.

46. (previously presented): The method of claim 44 further comprising:
the reef enhancing material is lead.

47. (previously presented): The method of claim 45 further comprising:
the reef inhibiting material is zinc.

48: (previously presented): The method of claim 44 further comprising:
the reef extend beyond the boundary of each respective deposition of reef enhancing material.

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49. (previously presented): The method of claim 45 further comprising:
the reef grows over at least a portion of each respective deposition of reef inhibiting material.

50. (previously presented): The method of claim 44 further comprising:
the reef template is diffused into the surface of at least the discharge region.

51. (previously presented): The method of claim 45 further comprising:
the reef template is diffused into the surface of at least the discharge region.

52. (previously presented): The method of claim 46 further comprising:
the reef template is diffused into the surface of at least the discharge region.

53. (previously presented): The method of claim 47 further comprising:
the reef template is diffused into the surface of at least the discharge region.

54. (previously presented): The method of claim 48 further comprising:
the reef template is diffused into the surface of at least the discharge region.

55. (previously presented): The method of claim 49 further comprising:
the reef template is diffused into the surface of at least the discharge region.

56. (previously presented): The method of claim 50 further comprising:
the reef is formed during normal operation of the gas discharge laser.

57. (previously presented): The method of claim 51 further comprising:
the reef is formed during normal operation of the gas discharge laser.

58. (previously presented): The method of claim 52 further comprising:
the reef is formed during normal operation of the gas discharge laser.

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59. (previously presented): The method of claim 53 further comprising:
the reef is formed during normal operation of the gas discharge laser.

60. (previously presented): The method of claim 54 further comprising:
the reef is formed during normal operation of the gas discharge laser.

61. (previously presented): The method of claim 55 further comprising:
the reef is formed during normal operation of the gas discharge laser.

62. (previously presented): The method of claim 50 further comprising:
the reef is formed by exposure to energized fluorine during manufacturing.

63. (previously presented): The method of claim 51 further comprising:
the reef is formed by exposure to energized fluorine during manufacturing.

64. (previously presented): The method of claim 52 further comprising:
the reef is formed by exposure to energized fluorine during manufacturing.

65. (previously presented): The method of claim 53 further comprising:
the reef is formed by exposure to energized fluorine during manufacturing.

66. (previously presented): The method of claim 54 further comprising:
the reef is formed by exposure to energized fluorine during manufacturing.

67. (previously presented): The method of claim 55 further comprising:
the reef is formed by exposure to energized fluorine during manufacturing.